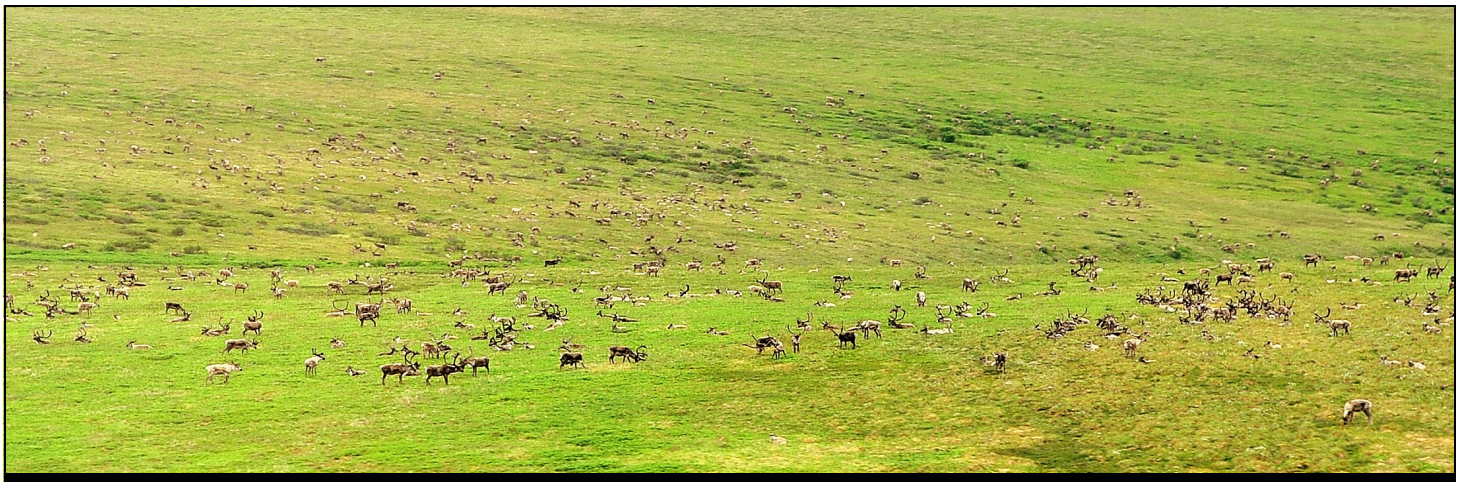
Arctic Network Newsletter

Alaska Region Inventory & Monitoring Program

National Park Service
U.S. Department of the Interior



For the first time GPS-satellite collars were deployed on Western Arctic Herd caribou (pg. 3)

Vegetation after tundra fires (pg. 3)

Science for the stewardship of Arctic Parklands

2010 Spring and Summer Monitoring and Field Activities

May

Welcome Kristin DeGroot - ARCN's new biotechnican

Public comment period begins in May for the ARCN Climate Stations Environmental Assessment

17-28 YUGA seasonal training

22-31 Brown bear survey GAAR (B. Shults)

June

1-2 Brown bear survey GAAR (B. Shults)

1-5 Caribou tracking out of KOTZ (K. Joly)

11-30 Landbird survey NOAT/GAAR (M. Flamme)

23-26 Thermokarst Inventory/Aerial Photography (D. Swanson)

July

5-14 Dall's sheep survey GAAR (K. Rattenbury, J. Schmidt)

19-26 Dall's sheep survey WRST -collaboration with CAKN (K. Rattenbury, J. Schmidt)

10-13 Vegetation surveys NOAT (D. Swanson)

17-24 Vegetation surveys GAAR (D. Swanson)

August

9-14 Small mammals monitoring DENA- collaboration with CAKN (M. Flamme)

17-23 Shallow lakes KOVA– contract with ABR Inc.

Cover Photographs

Top: Western Arctic Caribou Herd, BELA (Photo by Ken Hill)

Middle: (Left) 2007 Tundra Fire, Anaktuvuk River; (Right) Sedge tussocks and resprouting shrubs, post fire, at a study site along the Anaktuvuk River (2009)

Bottom: Lapland Longspur

About the Arctic Network

Our mission is to collect scientifically sound information through natural resource monitoring to contribute to park management and facilitate park preservation for future generations. We work in Bering Land Bridge National Preserve (BELA), Cape Krusenstern National Monument (CAKR), Gates of the Arctic National Park and Preserve (GAAR), Kobuk Valley National Park (KOVA), and Noatak National Preserve (NOAT).

More Acronyms

WEAR: Western Arctic Parklands (BELA, CAKR, KOVA, NOAT)
YUGA: Yukon-Charley Rivers/Gates of the Arctic
DENA: Denali National Park and Preserve
CAKN: Central Alaska Network
LACL: Lake Clark National Park and Preserve
WRST: Wrangell St. Elias National Park
ADF&G: Alaska Department of Fish and Game

Featured Vital Signs

Caribou

Caribou are ingrained in the history, traditions, and psyche of northwest Alaska. Many Alaska Native residents identify themselves as "caribou people". To monitor this important vital sign, ARCN and ADF&G deployed 39 GPS satellite collars on the Western Arctic Herd in September 2009. These collars will provide biologists with the locations of these caribou every 8 hours, 365 days a year.

In addition, as part of a cooperative effort with the Bureau of Land Management and US Fish and Wildlife, we investigated winter range habitat. The results of these studies include that: wildfires covered about 10% of the tundra ecosystems of northwest Alaska and that tundra habitats were more than 4 times as likely to reburn as boreal forest habitats in the last 55 years. Fire activity in tundra ecosystems was associated with warmer and drier summers, especially when it occurred later in the summer.

A large-scale climate pattern, similar to El-Nino, called the Pacific Decadal Oscillation (PDO) was also associated with fire activity. Recognizing the importance of large-scale climate patterns, the NPS and collaborators were able to identify links between the population growth rates of the arctic Alaska caribou herds and the PDO.

For more information contact :
Kyle Joly (Kyle_Joly@nps.gov)

Fire Extent and Severity

During the very warm, dry summer of 1977 several large tundra wildfires occurred in northwest Alaska, including a 258,000 acre fire in Bering Land Bridge National Preserve. This fire has been monitored for fire effects since 1978 by cooperators of the National Park Service (NPS) and Bureau of Land Management (BLM). Monitoring of Alaskan arctic tundra re-vegetation (from one to 32 years post-fire) revealed vegetation change related to original vegetation type, fire severity, topography and soils.

1978: one year post-fire

There has been a dramatic and continued expansion of willow (*Salix pulchra*, diamond leaf willow) along several monitoring transects. On the steeper slopes, cover, height and diameter of willow have nearly doubled in the past eight years. Lichen and Sphagnum moss have continued to show slow recovery.

2009: 32 years after fire, willow cover 30-40%

Tundra fires in arctic Alaska are predicted to increase in frequency, size, and severity with climate warming, permafrost thaw, shrubbier vegetation, and more lightening.
Look for an NPS podcast about this project to be coming out soon to the Bering Land Bridge National Preserve website, http://www.nps.gov/bela/photosmultimedia/multimedia.htm.
For more information contact: Jennifer Barnes (Jennifer_Barnes@nps.gov)

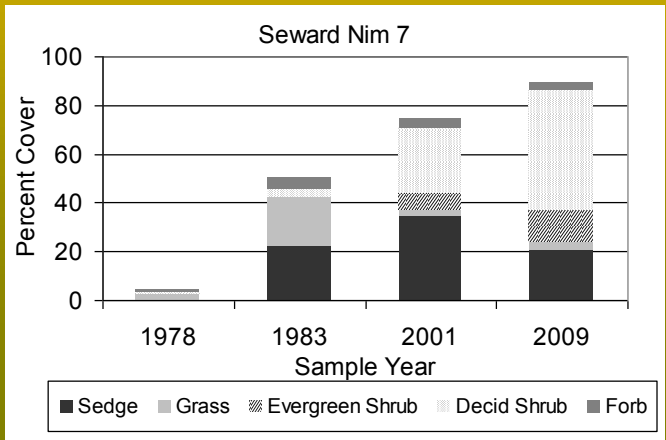


Figure on right: Change in growth forms on face slope of Nimrod Hill, Seward Peninsula .

Monitoring Vital Signs in the Arctic Network-Updates

Acronyms can be found on pg 2

Shallow Lakes

Contact: Amy Larsen (Amy_Larsen@nps.gov)

During shallow lake sampling in KOVA in 2009, NPS staff observed extensive permafrost degradation. Ten lakes were observed that had catastrophically drained due to permafrost degradation along the lake outlet or expansion of ice wedge polygons near the lake margin. Extensive lake drying was observed along the sand sheet between the Kobuk sand dunes. Drying here may be due to increased evaporation rates associated with climate warming.

Dall's Sheep

Contact: Kumi Rattenbury (Kumi_Rattenbury@nps.gov)

J. Withers

ARCN and CAKN are collaborating to develop methods for monitoring the abundance and distribution of Dall's sheep in six of Alaska's largest parks and preserves: DENA, GAAR, KOVA, LACL, NOAT and WRST. In 2009, we tested distance sampling methods across GAAR, and estimated that there were 8,564 sheep (95% Confidence Interval: 6,586-11,130 sheep). Our findings suggest that distance sampling is a practical and efficient way to estimate sheep abundance over large areas, and we will refine these methods for surveys in GAAR and WRST in 2010. ARCN and ADF&G also conducted aerial minimum count surveys in the western Baird Mountains of NOAT in July 2009, and results indicate that this population has continued to increase since a decline in the early 1990s.

Landbird

Contact: Melanie Flamme (Melanie_Flamme@nps.gov)

Passerine birds comprise more than 50% of the bird species in ARCN. It is estimated that approximately 150 avian species are found within the diverse habitats of GAAR and NOAT. In 2010, new survey methods will be tested to determine long-term trends in landbird species composition, distribution, density, and frequency of occurrence along the Noatak River from GAAR into NOAT during the breeding season (June). Survey methodology utilized by the Breeding Bird Survey, Alaska Landbird Monitoring survey will be adopted and refined by ARCN and continued annually for the long-term monitoring program.

Permafrost

Contact: Dave Swanson (Dave_Swanson@nps.gov)

In the last few years, people traveling in the Arctic Network parklands have noticed quite a few new slumps and small landslides related to thaw of permafrost (permanently frozen ground). These slumps can shed considerable amounts of sediment into rivers and lakes and also destroy valuable cultural sites. ARCN is mapping these features using detailed new imagery taken from satellites. We have completed mapping for BELA, CAKR, and KOVA and have found many new slumps in NOAT, especially in the hills surrounding the Noatak River. In 2010, we plan to complete our analysis of the satellite imagery of NOAT and GAAR and visit some of the more active features for closer study.

Muskox Herd Composition

Contact: Jim Lawler (Jim_Lawler@nps.gov)

In March of 2010, ARCN and cooperators from ADF&G conducted muskox age and sex composition surveys in CAKR and in the northwest portion of the Seward Peninsula (ADF&G Game Management Unit 22E). Of the 152 animals located during the CAKR survey, 24% were mature bulls (≥4 years old), 7% were 3-year old bulls, 3% were 2-year old bulls, 31% were mature cows (≥ 4 years old), 14% were 3-year old cows, 3% were 2-year old cows, and 12% were yearlings. On the Seward Peninsula in Unit 22E, a total of 360 muskoxen were classified: 24% were mature bulls, 5% were 3-year old bulls, 5% were 2-year old bulls, 38% were mature cows, 8% were 3-year old cows, 6% were 2-year old cows, and 15% were yearlings. Results such as these, in combination with population counts, provide valuable information for managing muskoxen in northwestern Alaska.

Outreach

The pilot year (2009) of the yellow-billed loon monitoring outreach program made its debut in Kotzebue, Alaska high-school classrooms. Education specialists Linda Jeschke (WEAR) and Tracie Pendergrast (GAAR) along with local educator Meghan Nedwick and biologists Joel Schmutz (USGS) and Melanie Flamme (GAAR) worked collaboratively to develop a program highlighting the yellow-billed loon vital sign. Real data from yellow-billed loon research and monitoring programs was provided to educators to develop a lesson plan that incorporated the species' biology and conservation status as well as a Google Earth exercise plotting telemetry data of radio-tagged loons. A prepared mount of a yellow-billed loon traveled with the program, demonstrating the species' size and morphology. A grant to fund the travel for the program was obtained so that additional villages within and adjacent to the Arctic Network parklands can be visited next year.

Inventories

From 1999 to 2007 NPS staff, graduate students, and outside researchers conducted an extensive lichen inventory of the Arctic Parklands including 371 plots and 74 targeted surveys. The team documented 491 lichen species and described three species new to science. The three new species are all members of the genus *Hypogymnia*, a striking genus with a rosette of hollow, white lobes and a dark underside. The new taxa were published by lichen expert Dr. Bruce McCune of Oregon State University. A database of over 14,000 lichen records was submitted to NPS's online species database, and a Google Earth web-based map-server is under development. As shrubs continue to increase in ARCN parks, tundra habitat is expected to be lost for arctic lichen species. The long-term monitoring plots established by the team will track the distribution of the lichens throughout ARCN on a decadal basis.

ARCN Publications

Joly, K., T. S. Rupp, R. R. Jandt, and F. S. Chapin III. 2009. Fire in the range of the Western Arctic Caribou Herd. Alaska Park Science 8:84-91.

Joly, K., R. R. Jandt, and D. R. Klein. 2009. Decrease of lichens in arctic ecosystems: role of wildfire, caribou and reindeer, competition, and climate change. Polar Research 28 (3):433-442.

Holt , E. A., McCune, B. and P. Neitlich. 2009. Macrolichen communities in relation to soils and vegetation in the Noatak National Preserve, Alaska. *Botany* (87): 241-252.

McCune B., Holt, E., Neitlich, P., Ahti, T., and R. Rosentreter. 2009. Macrolichen diversity in Noatak National Preserve, Alaska. *North American Fungi* (4) 4: 1-22.

Holt E. A. and P. Neitlich. 2009. Lichen Inventory Synthesis: Western Arctic National Parklands and Arctic Network, Alaska. NPS Natural Resource Technical Report, in review.

Scott's Corner: Data Management

Good data management has been a high priority of the Inventory & Monitoring program since the inception of the program. Changes are often not noticeable on a day to day basis, but looking back over just a few short years reveals numerous improvements in the way we handle our most valuable commodity. One great change is the new NRInfo portal. This month the Natural Resource Program Center will deliver on its promise to roll many clunky service-wide databases into a single, seamless information system. All the databases you used to know and love such as NPSpecies, NatureBib and the NPS Data Store will be phased out in the middle of May and the NRInfo portal will be available at the end of May. NRInfo is built on a service oriented architecture which is a techie way of saying all the components talk to each other and can provide information on-demand to many different kinds of software and information management systems. Best part? No passwords or logins!

Featured Staff

Kate Schaefer
Data Management Assistant and GIS guru

Kate was appointed to the Student Temporary Employment Program (STEP) in the spring of 2009 to assist ARCN with data management and GIS. Originally from Austin, Texas, where she was born and raised, she came to Alaska to attend the University of Alaska Fairbanks. This May she graduates with a bachelor's degree in Geography. She was recently accepted to a graduate program at Penn State University to further her studies in geography. Luckily for ARCN, this program is primarily online and Kate will remain in Fairbanks and continue her work here at NPS. Kate recently married Wes Schaefer last winter solstice (their 3rd year anniversary will fall on the last day of the Mayan calendar). One of her favorite pastimes is exploring the underwater world with SCUBA, even when the water is cold. For the last two years, Kate handled dogs for Lance Mackey (4-time winner of the Yukon Quest and the Iditarod). She drove 20 hours to Dawson City for the Yukon Quest race and then deprived herself of sleep for 36 hours to care for these amazing, canine athletes.

Ken Hill
Physical Scientist

Utah born and raised, Ken came to ARCN and Fairbanks in the spring of 2009 from Colorado. His first experience with Alaska was at Toolik Field Station on the North Slope studying fish and hydrology during his undergraduate program in Watershed Science at Utah State University. He completed his graduate research on changes in water quality due to climate change at the University of Colorado in Boulder. Afterwards, he spent two years with USGS working on mountain hydrology and snow science. His professional interest in these topics extend into his personal life as well– he enjoys skiing and mountaineering. When he's not working, you can find him skiing thigh-deep powder in the Rocky Mountains or scaling a technical route up a steep mountain. Ken brings a wealth of knowledge and expertise to ARCN and we are excited to have him on our staff.

ARCN V.I.P.s

Jen Brorson

Jen has volunteered with ARCN since last December. As a graduate in Natural Resources Management of University of Alaska Fairbanks, she brings a wide range of experience to ARCN, such as caring for large mammals in the Reindeer Research Program and at the Large Animal Research Station. Jen contributed to a variety of efforts here at ARCN; Dall's sheep, Landbirds, and Moose Vital Sign programs. Her efforts include preparation of map and study aid materials, equipment testing, GPS photolinking, and field logistics. This summer she'll be working as a Park Ranger at Harding Lake and we will miss having her help. She lives in North Pole with her fiancée.

Maya Uranishi

Maya is a University of Hokkaido, Japan, foreign exchange student visiting the University of Alaska Fairbanks. Her hometown is Nara, Japan. Maya has played a critical role in the production of a podcast about the purpose of the Arctic Network Inventory and Monitoring Program. Maya translated and narrated the podcast in Japanese, thus increasing its accessibility. She also assisted with the Landbirds and Muskox Vital Sign programs. She's an avid rock climber and skier and in her off-time visits remote cabins in Interior Alaska. This summer she will be volunteering on the brown bear in GAAR and small mammal surveys in DENA and with a salmon study conducted by ADF&G in Unalakeet.

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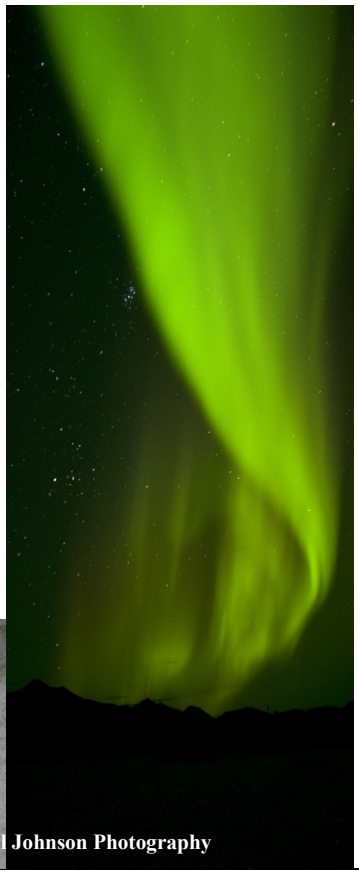

Technical Committee

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Additional NPS Collaborators

Kyle Joly, YUGA wildlife biologist

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